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THESIS

**THE ROLE OF PERSONALITY TYPE
ON MINORITY ATTRITION
AT THE U.S. NAVAL ACADEMY**

by

Carl A. Burkins

June 2002

Thesis Co-Advisors: Brad Johnson
                                                      Susan Hocevar

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The attrition rate at the Naval Academy is higher for minority vs. non-minority students. This thesis examines the predictors of minority attrition at the Naval Academy. Three categories of predictor variables are examined: gender, academic measures, and MBTI personality type. Specifically, the study focuses on the theories of college student attrition based on data from Historically Black Colleges and Universities, as well as traditional civilian universities. Data obtained from the Naval Academy's Institutional Research were analyzed. Results of the quantitative analysis show that the standardized test used in the admissions process (SAT) held little predictive value when examining minority attrition. A major finding drawn from Chi Square analysis of the Myers-Briggs Personality Type Indicator revealed that several active personality types did better in terms of persistence at the Naval Academy. Recommendations addressed several areas of possible improvement and proposed further research regarding minority attrition.

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THE ROLE OF PERSONALITY TYPE ON MINORITY ATTRITION AT THE U.S. NAVAL ACADEMY

Carl A. Burkins
Lieutenant Commander, United States Navy
B.A., University of New Mexico, 1990

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June 2002**

Author: Carl A. Burkins

Approved by: Brad Johnson, Thesis Co-Advisor

                   Susan Hocevar, Thesis Co-Advisor

                   Douglas Brook, Ph.D., Dean
                   Graduate School of Business and Public Policy

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ABSTRACT

The attrition rate at the Naval Academy is higher for minority vs. non-minority students. This thesis examines the predictors of minority attrition at the Naval Academy. Three categories of predictor variables were examined: gender, academic measures, and MBTI personality type. Specifically, the study focuses on the theories of college student attrition based on data from Historically Black Colleges and Universities, as well as traditional civilian universities. Data obtained from the Naval Academy's Institutional Research were analyzed. Results of the quantitative analysis show that the standardized test used in the admissions process (SAT) held little predictive value when examining minority attrition. A major finding drawn from Chi Square analysis of the Myers-Briggs Personality Type Indicator revealed that several active personality types did better in terms of persistence at the Naval Academy. Recommendations addressed several areas of possible improvement and proposed further research regarding minority attrition.

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I.   INTRODUCTION

A.   BACKGROUND

The attrition rate of midshipmen at the United States Naval Academy continues to be higher for minority vs. majority students. The United States Naval Academy opened its doors in 1845 to train "young men in the skills required to become Naval Officers." As the primary accession source for Naval Officers the official mission is to develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to a career of Naval service and have potential for future development in mind and character to assume the highest responsibilities of command, citizenship and government (Reefpoints, 2001).

With the exception of three African Americans who briefly attended the Academy during Reconstruction and a sprinkling of Latin American foreign nationals, the Brigade of Midshipmen was completely homogenous until after WWII. In 1946, Wesley L. Brown became the first minority midshipman to attend and graduate from the Academy in the class of 1949. Integration of the Brigade of Midshipmen has been slow and steady for the past quarter century. "Of the 178 blacks who were admitted for the classes of 1949 to 1975, one hundred graduated, a rate of 56 percent as compared to a 69 percent graduation rate for their 22,309 classmates" (Bodnar, 1999). Of the approximately 1,200 students admitted as plebes (freshman) each year, approximately 200 are minorities. Because of the stringent admissions policy, an average of 10,000 apply, of which 1,200 are admitted. There is adequate reason to believe that all who are admitted have the potential to graduate.

B.   PURPOSE OF STUDY

This thesis examines the relationship between personality type and minority attrition at the Naval Academy. The objective is to determine if there is a link between the Myers Briggs Personality Type Indicator and minority attrition. This information should provide a more informed understanding of minority midshipmen at the Naval Academy and how their attrition may be connected to personality. Additionally, the thesis

provides a cohesive framework of analysis that the Naval Academy can use to monitor progress toward reducing minority attrition in succeeding years.

C.   SCOPE/METHODOLOGY

This study seeks to identify and examine factors that contribute to the attrition of minority students from the Naval Academy. The scope includes: (1) a historical review of the integration of minorities into the military; (2) attrition rates at Historically Black Colleges and Universities; (3) attrition rates of minorities in military college settings; (4) data on Naval Academy attrition; (5) an analysis of the Myers-Briggs Type Indicator (MBTI) personality preferences of all midshipmen from the graduating classes of 1991 through 2001.

D.   ORGANIZATION OF THESIS

This thesis is organized into five chapters and seven appendices. Chapter II contains historical and background information on the integration of minorities into the Brigade of Midshipmen, as well as reviews of pertinent literature related to college student attrition. Chapter III explains the research methodologies employed. Chapter IV presents the empirical results of analysis of data obtained on minority midshipmen. Chapter V summarizes conclusions from the research and offers both policy recommendations and suggestions for further research.

II.   LITERATURE REVIEW

A.   HISTORY OF MINORITIES IN THE MILITARY

The racial integration of the armed forces was a momentous event in our military and national history; it represented a milestone in the development of the armed forces and the fulfillment of the democratic ideal. The existence of integrated rather than segregated armed forces is an important factor in our military establishment today. History has shown that there were legal, administrative and social barriers that had to be overcome before minorities would enjoy full participation in the military service of their country. It took the experiences of World War II and the postwar pressures generated by the civil rights movement to compel all the services to reexamine their traditional practices of segregation (Bodnar, 1999, MacGregor, 1985).

Bodnar hypothesized that in order to change the military four stages had to take place: stonewalling desegregation, leveling the playing field, gaining a representative share, and percolation.

> First comes a stonewall where the senior leadership cannot accept the new values and attempts to stop or subvert the process. The next two stages can come in either order; leveling the playing field so that any individual of the minority attains an equal footing; and gaining a representative share where the minority as a whole has access to majority organization. Finally, there is the percolation stage in which prior changes take at least another generation to bring to fruition (Bodnar, 1999).

American history shows that minorities have been involved in every major military conflict since the American Revolution. Minorities have often served in the militaries, as a route to acceptance by the majority. The pattern of acceptance of minorities during times of war and segregation during times of peace would continue until late in the twentieth century. From the Boston Massacre to Valley Forge, over 5000 minorities served in various capacities during the Revolutionary War. During the Civil War, President Lincoln authorized General Grant to enlist slaves into the Union Army. By the end of the Civil War, 400,000 Blacks had participated on both sides with about half serving as soldiers and the other half serving as laborers. Twenty- three Black soldiers and sailors were awarded the Medal of Honor for bravery in combat.

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During the post-Civil War era, most Black soldiers served in segregated units commanded by White officers. Due to the massive casualties suffered during the Civil War, four Black regiments were created and assigned to the western states. Led by White officers, these "Buffalo Soldiers" fought Native Americans and filled remote outposts in the western territories. In the years between 1865-1890, eighteen "Buffalo Soldiers" won the Medal of Honor for heroic service to their country (Jones, 1995, Coates, 1988).

The pattern of racial segregation and discrimination was prevalent and firmly entrenched in American society during the 20th century. During World War I, Blacks and Hispanics were drafted and employed in a variety of menial capacities. The total number who served in the armed forces was in almost exact proportion to their representation in the population. Of the approximately half million who served 20,000, were in the Navy and 42,000 were combat troops. Due to heavy casualties, the Army established an officer training camp and 1,353 minority men and women were commissioned. It should be noted that the great majority served in service units and labor battalions. During the post-war period, most of the minority officer corps was discharged soon after the war ended (Jones, 1995).

As World War II approached, the War Department stated that the abandonment of segregation would be detrimental to national defense. During the course of the war, over two million Blacks were screened and over one million served on active duty. The breakdown was as follows Army-700, 000, Navy-165, 000, Marines-17, 000 and Coast Guard-4, 600. In the officer ranks of the Army, there was one Black officer per 100 enlisted men, compared with one White officer per eight enlisted men. In the Navy, a total of 58 male Black officers were selected and commissioned during WWII. (Jones, 1995)

The first real move to integrate the military came during the presidency of Franklin Roosevelt whose liberal views on social issues was resisted by the conservative members of the military. Continuing the trend of World War I, most minorities served in service or support functions. The President ordered the military to recruit minorities into all areas of the military. The Navy was ordered to produce a plan to put 5,000 Negroes, into billets other than stewards. The steward branch of the Navy at this time was

comprised entirely of Black and Filipino sailors. The Naval hierarchy obeyed the order but minimized its effects by slating many Blacks into jobs in segregated construction battalions or to ammunition depots (Bodnar, 1999, MacGregor, 1985).

America's military was legally segregated until the late 1940's, and aggressive equal opportunity policies did not come along until the 1960's. Following the mandate of President Harry S. Truman, who signed Executive Order 9981, desegregation of the United States military became official Pentagon policy (Moskos, 1996). Beginning with the Korean War in 1950, desegregation became the practice first on the training bases in the states and then in combat units in Korea. One of the key arguments against desegregation was that integrated units would not have the necessary cohesion to be effective. "In Korea, for the first time since the Revolutionary War, Negroes and Whites fought in formally integrated units. As integration in Korea became standard, commanders noted that there was no difference between the fighting abilities of Negroes and Whites. Indeed, integrated units fought better than all-white or all-black units (Bodnar, 1999, Moskos & Butler, 1996, MacGregor, 1985).

1. Minority Attendance at Military Academies

The armed forces were integrated in two phases (Bodnar, 1999). First, organizational integration put an end to any formal discrimination in recruitment, training, retention, and on-base living arrangements. The last racially segregated unit in the armed forces was abolished on October 30, 1954. The second phase, leadership integration, was more problematic and would require 25 years to implement. It would require a cultural change within a military whose officer corps and senior leadership grew up in a segregated system. Most personal values and political beliefs are formed during youth and tend to last a lifetime. Therefore change occurs when younger generations supplant older generations with differing viewpoints. The first minorities graduated from West Point in 1941, and the Naval Academy in 1949. However, lasting change would not occur until the old guards, products of a segregated system, were supplanted by the new blood, raised in a desegregated system.

Therefore, "a new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it" (Bodnar, 1999).

The numbers of Blacks in the services remained relatively stationary between 1962 and 1968, when Blacks accounted for 11 percent of the American population. Their share of the enlisted service population remained at 8.2 percent, with significant differences among the services. The low percentage of Black officers would remain constant as well. Between 1963 and 1968 the three service academies graduated just 51 black officers. The service academies have always been among the most selective institutions in higher education. The scholastic and medical qualifications coupled with the poor quality of segregated schools combined to limit the pool of minority applicants to each of the service academies (MacGregor, 1985, Jones. 1993).

In order to attend one of the four service academies, the Naval Academy, West Point, Air Force Academy, or the Coast Guard Academy, an official nomination is required. The nominations can come from a variety of sources including the United States President and Vice-President, United States senators, representatives, and the delegate to Congress from the District of Columbia or the resident commissioner of Puerto Rico. Because the service academies are financed by funds appropriated by Congress, they are unique public institutions. Congress has tremendous influence in the running of the service academies. The lack of minorities can be directly linked to the lack of Congressional nominations. For many years congressional representatives, with the exception of a few northern liberal democrats, would not nominate minorities from their districts to the service academies. Table 1 shows the numbers of minorities attending the three service academies from 1969–1972 (MacGregor, 1985).

Table 1: Minorities Attending Service Academies (1969-1972)

Academy	Class of 1969	Class of 1970	Class of 1971	Class of 1972	Total Negro	Total Academy Attendance
Army	10	7	5	9	31	3,285
Navy	2	8	8	15	33	4,091
Air Force	6	10	13	23	52	3,028
Totals	18	25	26	47	116	

Source: Office, Deputy Assistant Secretary of Defense (Civil Rights).

The senior Military leadership had become invested in the integration of the services by the late 1960's. In order to increase the participation of minorities at the service academies, they lobbied Congress and got approval for the service Secretaries to nominate qualified alternates, and they looked to non-traditional sources. The Prep Schools – U.S. Military Academy (USMAPS), Naval Academy (NAPS), and Air Force (AFPS) – became a conduit for junior enlisted and qualified high school students who came close to meeting the standards but had not been accepted. Attendance at a prep school is essentially a fifth year of high school with an emphasis on math and sciences in addition to physical fitness. In 1969, the Broadened Opportunity for Officer Selection and Training Program (BOOST) was instituted at NAPS to increase minority enrollment in ROTC units and the Naval Academy (MacGregor, 1985, Jones, 1993).

2. Minority Participation in ROTC

It should be noted that a key source of minority officers has always been the Reserve Officer Training Corps (ROTC) units at Historically Black Colleges and Universities (HBCUs). The three sources of a commission in the armed forces are service academies, ROTC units, and Officer Candidate School (OCS). Each of the military services operates both scholarship and non-scholarship ROTC programs. The Army and Navy also operate officer candidate schools; the Air Force calls its school an officer training school (OTS). All of these schools accept enlisted personnel who wish to become officers, as well as civilians who have completed college and desire a commission. The programs require a maximum of 16 weeks and provide basic military education for prospective officers. Table 2 gives a percentage breakdown of officers commissioned by training program. It shows that while the numbers have increased for the service academies, ROTC commissions have increased even more dramatically. The decline in the number of OCS commissions is a product of force shaping, as this is the only direct commissioning source.

Table 2: Percentage of Officers Commissioned by Training Program

Calendar Year	Academies	ROTC	OCS/OTS
1980	9	25	28
1981	9	26	25
1982	9	30	20
1983	9	31	23
1984	11	36	19
1985	10	34	24
1986	11	31	23
1987	12	34	18
1988	13	38	13
1989	12	37	12
Notes: Percentages do not add to 100 percent because numbers exclude direct appointments (lawyers, doctors, warrant officers, etc). OCS= Officer Candidate School OTS = Officer Training School ROTC= Reserve Officer Training Corps			

Source: Data supplied by Department of Defense, (1993).

The Vietnam era was a turbulent and troubled time for the military and America as a whole. The armed forces and society were split along racial fault lines. Three distinct groups were at play, a vocal and powerful antiwar movement at home led mainly by whites, leaders of the Black Community who criticized the Selective Service System for sending the best and brightest young Blacks to fight and die in Vietnam, and middle class whites who were adept at avoiding the draft both legally and illegally. These years were marked by well-publicized breakdowns in discipline among servicemen and an atmosphere of racial hostility in the ranks (Moskos, 1996).

The 1970's were significant for minorities because of two key pieces of legislation – (1) the abolishment of the draft and the shift to an all-volunteer force in 1973, and (2) the Stratton Bill in 1976 that allowed women to attend the service academies. In 1979, the number of Black officers had increased nine-fold from 1964, but still accounted for less than three percent of officers in the Navy. Edward Hidalgo

became the first Secretary of the Navy of Hispanic origin and Horacio Rivero became the first Hispanic four–star admiral, serving as Vice-Chief of Naval Operations.

In 1990, the highest ranking African American military member, the Chairman of the Joint Chiefs of Staff, General Colin Powell, would lead the military during the Persian Gulf War. The numbers of minorities continue to grow and are coming more in line with the representative share of the population. In 2002, the number of minority officers in each service are 12 percent Army, 5.7 percent Navy, 4 percent Marine Corps and 10 percent Air Force (Jones, 1993).

In the 20 plus years since the Stratton Bill and the shift to an all-volunteer force, the pace of change and integration continues to grow. The repeal of the combat exclusion law in 1993 has also done much to ensure gender equity and further shape the force. Each incoming class at the three service academies is approximately 24 percent minority. The number of NROTC scholarships awarded to minorities also has increased ensuring that the officer ranks continue to come more into line with the enlisted ranks. The Army is the only service to have minority officers enlisted in proportion to the U.S. population.

Scholars base most research on student retention on sociological principles and theory, and they tend to focus on groups rather than individuals. Tinto (1993) developed a sociological model of student retention based on the experiences of minority, adult, and graduate students. This model suggests that student persistence is affected by the degree to which students are integrated into a college's social and academic communities. Social interaction with faculty members and peers may contribute to social integration, while grade performance and intellectual development lead to academic integration. Additionally, successful integration leads to further commitment to the institution and academic goals, thus contributing to a student's persistence. Astin (1996) and Allen (1992) conducted a series of studies that support Tinto's premise regarding the affect of integration on persistence.

In 1989 and 1994, the Minority Midshipmen Study Groups (MMSG) were formed to study minority issues at the Naval Academy. They produced a document called Report to the Superintendent on the Study of Minority Midshipmen. The MMSG was assigned the task of investigating the environment that minority midshipmen, men and

women, experience when they join the Brigade of Midshipmen. The group looked for institutional, cultural, academic, or professional impediments to the minority midshipman's potential for successful completion of the four-year program.

The MMSG looked at the three areas in which midshipmen are evaluated – academic performance, military performance, and physical performance. A review of the Academic Center found that it has had a positive impact on the retention of minority midshipmen since its establishment in August 1989. Academic integration, specifically the assistance available to midshipmen experiencing academic problems, was identified as a problem area. The military performance grades of minority midshipmen were compared to those of majority midshipmen. Minority grades, while lower, were approaching the average for the Brigade. While the overall racial climate at the academy was good the MMSG made several recommendations to further improve the effectiveness of the organization. They included increasing the number of Hispanic and African American officers in academic assignments and in senior leadership positions (MMSG, 1996).

B. ATTRITION STUDIES

1. Historically Black Colleges and Universities

Of the 103 Historically Black Colleges and Universities (HSBCUs) existing today, approximately 46% are public and 54% are private. They are a mixture of 2-year and 4-year institutions, as well as schools that offer advanced and professional degrees; and they are situated in every quarter of the country, the District of Columbia and the Virgin Islands. Currently, these institutions enroll approximately 500,000 undergraduate students and 50,000 graduate, professional and doctoral students. These institutions enroll approximately 16% of all African American college students and confer 30% of all baccalaureate degrees earned by African Americans annually (Ponder, 2001).

Some clues as to why minorities leave the Naval Academy may be gleaned from general studies of student attrition from Historically Black Colleges and Universities. Comparisons between African American student populations on Black and White campuses require recognition of the "special mission" of Black colleges. To a large

extent, Black colleges enroll students who otherwise might not be able to attend college because of social, financial, or academic barriers. These institutions pride themselves on their ability to take financially disadvantaged, academically under-prepared, Black students and correct their academic deficiencies. Black colleges graduate their students equipped to compete successfully in graduate schools or in their chosen professions (Blackwell, 1987).

Astin (1996) found that African Americans who attend HSBCUs are more likely to complete their degrees when they are compared with African Americans of comparable academic preparation who attend non-HSBCUs. There is a 17% greater chance of degree completion at a HBCU based on institution size and selectivity. "For example, if the student is considering a typical non-HBCU of similar size, there is basically no difference. Indeed, if the student is considering a highly selective alternative to the HBCU, the chances of degree completion might be even worse in the HBCU. On the other hand, if the student is considering a non selective alternative college, the chances of degree completion will probably be much better at the HBCU" (Astin, 1996,).

2. Comparative Studies on Attrition

Gurin and Epps (1975) studied over 5,000 African American students enrolled in ten traditionally Black institutions from 1964 to 1970. Fleming (1984) later studied a sample of 3,000 Black and White college students, which included students attending predominantly White colleges. Fleming's basic research question, "Who gets the most out of college?" yielded answers that echoed Gurin and EPP's (1975) findings on predominantly White campuses. Specifically, White males benefited more than females (both Black and White) and more than Black males from the college experience, measured in terms of cognitive growth, social participation, assertiveness, academic success, satisfaction, and general social-psychological adjustment. On historically Black campuses, the developmental profiles of Black males evidenced similar advantages relative to Black females. Fleming (1984) thus described college as a "man's world" where women usually brought up the rear. She qualified this conclusion by indicating that it was primarily true for White males enrolled in predominantly White colleges and for Black males enrolled in predominantly Black colleges (Allen, 1992).

Among Black students, Fleming (1984) found that females were more anxious in competition, felt less competent, and tended to be less assertive than males. Social passivity was especially common for Black females attending historically Black institutions, where they suppressed their assertiveness in order to cultivate relationships with men. On predominantly White campuses, however, these articulate, interpersonally adept females gained more from the academic experience than Black males. At the same time, they reported experiencing emotional pain for both failed relationships and social isolation (Allen, 1992).

Astin (1996) reported the following degree completion rates based on a national study of 365 baccalaureate-granting institutions that participated in the Cooperative Institutional Research Program's (CIRP) annual survey of entering freshmen in the fall of 1985. This study covered nine years and collected data on 95,406 students. Only about two in five students (39.9 percent) were able to complete a bachelor's degree within four years of entering college. This number rises by 5% to 44.9% if the time is increased to six years. He also found that women graduate at a higher rate than men 43.2% to 36.8%, respectively. Table 3 compares degree attainment rates for different racial groups across three time periods. Differences between Whites and members of underrepresented minority groups will be exaggerated if one looks only at four-year rates. This is especially true for African Americans, whose nine-year rate of 33.9% is more than 75% higher than their four-year rate of only 19.4%. These figures also suggest, once again, that the same factors that contribute to low college attendance rates and low retention among underrepresented minorities also prolong the time that it takes them to complete the bachelors degree.

Table 3: Four Year, Six Year and Nine-Year Degree Attainment Rates By Racial Group
in a Sample of 75,752 Students

Racial Group	FOUR YEAR	SIX YEAR	NINE YEAR
White	42.7	46.8	47.3
African American	19.4	31.2	33.9
American Indian	22.9	30.7	33.2
Asian –American	50.2	56.6	57.6
Mexican-American	30.5	38.3	39.5
Puerto Rican	26.8	34.6	36.9
Other	34.4	41.3	43.7

Astin, (1996).

Several studies on attrition found that approximately 75 percent of students that depart from college leave during the first two years, with the greatest proportion exiting during the first year of enrollment. Tinto (1993,1997); Cahill (1993); and O'Conner (1993) also state that nearly 85 percent of the departures are voluntary and that they occur even though most students maintain adequate levels of academic performance. As a group, women are more likely to depart voluntarily than their male counterparts and men are more likely to stay in college until forced to leave for academic reasons. Academic and social integration on the campuses of HBCUs appears to directly relate to persistence.

The models of college student attrition described above have not been applied to the unique characteristics and situations at a service academy. It goes without saying that the institutional life at the Naval Academy differs from that of a typical HBCU. However, they share two things in common, small size and teacher/ student ratio as well as a unique culture and reputation for success. Thus, a legitimate question can be raised: whether academic and social integration affect student attrition at the Naval Academy in the same manner or degree as at a HBCU. Most studies on college student attrition were conducted in a setting where the student population is fairly evenly divided between men and women. Given the highly competitive profile of the average high school graduate who is admitted to the Naval Academy, it is reasonable to question how rates of minority attrition at USNA will compare to HBCUs and other colleges.

C. ATTRITION RATES OF MINORITIES IN MILITARY COLLEGE SETTINGS

Scholars base most research on student retention on sociological principles and theory, and they tend to focus on groups rather than individuals. Tinto (1993) developed a sociological model of student retention based on the experiences of minority, adult, and graduate students. This model suggests that student persistence is affected by the degree to which students are integrated into a college's social and academic communities. Social interaction with faculty members and peers may contribute to social integration, while grade performance and intellectual development lead to academic integration. Additionally, successful integration leads to further commitment to the institution and academic goals, thus contributing to a student's persistence. Astin (1996) and Allen (1992) conducted a series of studies that support Tinto's premise regarding the effect of integration on persistence.

Roush (1989) conducted a study at the United States Naval Academy examining voluntary resignation from the perspective of persistence of students and goodness of fit to the institution. His findings of persistence were consistent with other research. Most students that voluntarily leave do so during the first two years. At the service academies students may resign at any time prior to the start of the junior year and not incur a financial repayment penalty. Roush looked at the classes of 1991 and 1992 and found that minorities accounted for 16.3 % of the entering class and accounted for 20% of the resignations, a difference that was not statistically significant.

O'Conner (1993) used the Roush model and examined a random sampling of 100 cadets at the Coast Guard Academy. The Coast Guard Academy and the Naval Academy use a four-class system and have similar academic, military and physical requirements. He found that individuals with the personality type Introvert (I), Intuition (N), Thinking (T), and Judgment (J) had the highest persistence rates. He also found that students who had academic difficulty tended to have lower military performance scores and resigned at a higher rate. He found significant correlations between personality preferences in particular (INTJ), academic success (higher GPA), military performance and persistence

at the Coast Guard Academy. It should be noted that this study did not look at gender or minority status.

Mitchell (1999) and Murray & Johnson (2001) conducted studies of gender differences and voluntary resignation at the Naval Academy by examining the differences in attrition rates between 1980 and 1996. Data came from reports made to the Superintendent by the Women Midshipmen Study Group and the Office of Institutional Research. Mitchell found that in 1980, women resigned at rate that was twice (20.2% vs. 10.6%) that of male midshipmen. More recent data in 1996 shows an attrition rate of 24.7% men vs. 34.9% women, an almost 10% higher rate. Murray, (2001) found that these percentages were higher than West Point ,29% for women and 25% for men, in 1996. At the Air Force Academy, the attrition rate for women was 19.7% vs. 23.5% for men during the same period.

Table 4: Number of Midshipmen Inducted and Attrition Rates (Percent) by Graduating Class and Gender

				Attrition Rates		Diff
Class	Male	Female	Total	Male	Female	F-M
1988	1245	113	1358	21.2	29.2	8.0
1989	1239	138	1377	20.4	31.9	11.5
1990	1220	143	1363	25.4	31.5	6.1
1991	1203	119	1322	27.4	31.9	4.5
1992	1208	149	1357	22.6	35.6	13.0
1993	1269	131	1400	23.0	30.5	7.5
1994	1105	136	1241	23.7	25.8	2.1
1995	996	146	1142	19.7	27.4	7.7
1996	1073	169	1142	24.7	34.9	10.2

Source: Women Midshipmen Study Group, Report to the Superintendent on the Status of Women in the Brigade of Midshipmen, United States Naval Academy, November, 1996.

D. PERSONALITY TYPE IN RELATION TO ATTRITION AND RETENTION

Carl Jung first developed personality typing in the 1920s. In its purest form, Jungian personality typing is extremely complex, and even today it is difficult to understand Jung's writings on personality (Noring, 1993). In the 1940's, Myers and Briggs resurrected Jung's theories, modified them, and developed a psychometric instrument called the Myers-Briggs Type Indicator (MBTI). The MBTI was developed to make Jung's theory of human personality understandable and useful in everyday life. It was one of the first self-report instruments that measured internal processes. MBTI results indicate a respondent's likely preference on four dimensions: Extraversion (E) or Introversion (I); Sensing (S) or Intuiting (N); Thinking (T) or Feeling (F); and Judging (J) or Perceiving (P) (Berens, 2000).

Jung said that the orientations of Extraversion and Introversion were dynamically opposite. A person cannot occupy both ends of this dimension. Extroverts are drawn to people and things outside themselves and tend to actively pursue external interaction drawing mental and emotional energy from these exchanges. Introverts tend to direct their energy and attention toward reflection and draw energy from quiet, introspective time (Kirby, 1997).

According to Jung there are two ways of gathering information, through Sensing (S) or Intuiting (N). Each individual will have a natural preference for one of these two opposite modes. Sensors prefer to gather information through what is actually present, or on data available to the senses. Those who prefer to gather information through intuition are drawn to the overall patterns and meanings that will put data into context (Kirby, 1997).

The Thinking (T) and Feeling (F) dimension looks at the two different ways people organize and structure information and make decisions. Thinkers like to apply logical principles to make objective decisions, while those who prefer Feeling, like to make decisions by a process of valuing. They filter situations through their own values,

the values of people important to them, and the values of the organization to which they are committed (Kirby, 1997).

Myers-Briggs added the Judging (J) and Perceiving (P) dimension to Jung's theory. This set refers to how people like to organize their external environment. Those people that direct the mental tool they use in making decisions toward the external world are described as Judging. They prefer their environment to be orderly, clear, planned and scheduled. Those individuals that have a more internal focus to the outside world are Perceivers. They prefer to keep their environment as open and unstructured as possible.

After more than 50 years of research and development, the MBTI is one of the most widely used instruments for understanding normal personality differences. The four sets of opposites described above result in 16 possible four-letter combinations, thus the MBTI describes 16 personality types (Kirby, 1997). It is used in such things as career exploration, development and counseling, organizational development; team building; management training; curriculum development and leadership development. More than three million MBTIs are administered each year in the United States and the instrument has been translated into more than two-dozen languages (Briggs-Myers, et al., 1998).

Mental health professionals do not frequently utilize personality typing in research or practice settings. Because personality typing does not measure mental health, and assumes that all preferences and types are equally normal and healthy, many clinicians do not find it useful. However, some do use this system for their patients and clients in order to enhance self-understanding and for other non-mental health related purposes such as marriage and career counseling (Noring, 1993).

Provost (1985) examined personality characteristics in relation to attrition at a private, four-year liberal arts college using the MBTI. A longitudinal study was conducted on the freshman class of 1980. These students were tracked for four years to observe their persistence or attrition, academic performance, and involvement in college. Four types were identified with high persistence rates: ESTJ, ESTP, ENTJ, and ESFJ. All four types have one preference in common, extraversion. Extraverts tend to be more involved than Introverts and to take a more active, as opposed to passive, posture in relation to the environment.

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The four types identified by Provost as more likely to attrite were ISTP, ESTP, ISFP, and ENFJ. "These students tend to be less organized, more passive in their relationship to the college environment, and less interested in theoretical courses and in learning for its own sake. They tend to be less assertive than other types about seeking what they need, initiating friendships, utilizing resources, asking questions in class, getting extra help, and so forth. They may not relate easily to structured, pre-planned activities". In a liberal arts setting, Sensing types may have more difficulty staying motivated (Provost, 1985).

Roush (1989) and Murray (2001) found that Naval Academy midshipmen are more likely to present with an extroverted personality type. ESTJ types made up the largest group and were more likely to graduate from the Naval Academy; whereas Feeling and Perceiving types were associated with dropping out. O'Conner (1993) found that individuals with the INTJ type were more suitable for academic and military success at the U. S. Coast Guard Academy than individuals with other combinations of type preferences.

E.   RESEARCH RATIONALE

This study adds to the literature on personality type, college attrition, and minority student success in an effort to portray minority midshipmen attrition at the Naval Academy. Minority students often have different needs that have to be addressed in order for them to succeed at majority colleges. It is also possible that, as a group, some minorities may have personality types that do not allow them to successfully cope with the stressful environment at the Naval Academy.

The purpose of this research was to examine the relationship between personality type and minority attrition. The present study was designed to provide an exploratory assessment of the relationship between personality type, achievement test scores, and high school class ranking and subsequent success or attrition among minority students at USNA. Specific research questions included the following:

(a) Are certain MBTI personality types significantly related to minority attrition at USNA?

(b) Are certain MBTI types significantly related to minority success at USNA?

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(c) Are there personality type differences between early vs. late attrites?

(d) Is there a link between academic performance and attrition?

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III.   RESEARCH METHODOLOGY

A.   INTRODUCTION

This thesis uses a quantitative method to analyze the relationship between the Myers Briggs Personality Type Indicator (MBTI) and voluntary attrition of minority midshipmen at the Naval Academy. The study used an archival design, and all midshipmen data were obtained from the Naval Academy's Office of Institutional Research. All data were collected at admissions and at graduation. In nearly all cases, midshipmen graduate exactly four years after admission.

1.   Data

The Naval Academy's Office of Institutional Research provided the academic and performance information on each midshipman. The Naval Academy established the Office of Institutional Research, Planning and Assessment in 1992 to evaluate institutional data enabling the Academy to make appropriate changes to the admissions, education and development processes. The Office of Institutional Research, Planning and Assessment at the Naval Academy (IR) provides the superintendent and the administration with a single source of evaluated information for midshipmen and Naval Academy graduate performance. IR also coordinates all surveys conducted at the Naval Academy including those on midshipmen, faculty and staff (USNA IR Homepage, 2002). IR maintains a data warehouse that contains information on each midshipman starting with the application process, throughout his or her training and education at the Naval Academy and continuing during active service in the Navy and Marine Corps.

The sample includes all 12,099 midshipmen for the classes 1991 through 2000. These midshipmen entered the Naval Academy between 1987 - 1996 and graduated four years later. The majority sample consisted of 9,873 midshipmen, 81.6% of the population. The minority sample consisted of 2,363 midshipmen, 18.4% of the total population. Valid MBTI scores were not available for 87 midshipmen and after evaluating for gender, race, year group and graduation status, these cases were dropped from the data set N= 2,226. Information was obtained on enrollment status, reason for attrition (if applicable), Myers-Briggs Type Indicator (MBTI) personality preference, last

semester enrolled, gender, ethnic group, Scholastic Aptitude Test (SAT) scores (verbal/math), and Recommendation of School Officials combined score (RSO).

The RSO score is derived from two forms consisting of 12 ratings completed by each candidate's English and Math instructors. Two officers, usually the Commanding Officer and Executive Officer, complete the RSO forms for each Fleet candidate. The admissions examiners then select the form with the highest score to complete the algorithm. The algorithm for scoring each recommendation is the sum of all points awarded for the answers to the 12 questions. Higher scores are better for potential candidates.

For the purpose of this study, all minorities that did not graduate for any reason other than medical disqualification are included. Attrition was split into four categories based on when the midshipman left the academy. Early attrites were fourth class and third class (freshman/sophomore) year. Late attrites were first/second class (junior/senior) year. I chose this split because historical data suggest most attrition occurs during the first year of college (Mitchell,1999) and after the first class of the junior year the midshipmen incur financial and time paybacks to the government. They can withdraw up to this point without repercussions. The median scores for SAT Math, Sat Verbal, and RSO combined were computed in order to make them dichotomous. The MBTI variables were chosen based on the literature review of specific personality types associated with attrition (see Table 5).

Table 5: Description of Variables Used in the Study

Variable Description	Variable Type	Variable Name	Values
Attrition	Binary	Attrite	1,0
Attrition Early or Late	Binary	attrite_early	1C/2C = 0 3C/4C = 1
Ethnic Codes	Binary	ethnic_c	
African American	Binary	AF	1,0
Asian	Binary	AS	1,0
Caucasian	Binary	CA	1,0
Filipino	Binary	FI	1.0
Hispanic	Binary	HI	1,0
Puerto Rican	Binary	PU	1,0
Native American	Binary	NA	1,0
Native Hawaiian	Binary	NH	1,0
Gender	Binary	gender	1,0 (1=male, 0=female)
Graduate	Binary	grad	1,0 (1=grad, 0=non grad)
MBTI Extrovert	Binary	mbind1e	1,0 (E=1, I=0)
MBTI Sensing	Binary	mbind2s	1,0 (S=1, N=0)
MBTI Thinking	Binary	mbind3t	1,0 (T=), F=0)
MBTI Judging	Binary	mbind4j	1,0 (J=1, P=0)
INTJ	Binary	INTJ	1,0 (INTJ=1, others=0)
ESTJ	Binary	ESTJ	1,0 (ESTJ=1, others=0)
ESTP	Binary	ESTP	1,0 (ESTJ=1, others=0)
ENTJ	Binary	ENTJ	1,0 (ENTJ=1, others=0)
ESFJ	Binary	ESFJ	1,0 (ESFJ=1, others=0)
ISTP	Binary	ISTP	1,0 (ISTP=1, others=0)
ESTP	Binary	ESTP	1,0 (ESTP=1, others=0)
ISFP	Binary	ISFP	1,0 (ISFP=1, others=0)
ENFJ	Binary	ENFJ	1,0 (ENFJ=1, others=0)
Recommendation of School Officals	Continuous	Rso_above	RSO above 877 =1 RSO 876 and Below = 0
SAT Verbal Above Sample Mean	Continuous	satvabv	610 through highest = 1 609 through lowest = 0
SAT Math Above Sample Mean	Continuous	satmabv	630 through highest = 1 629 through lowest = 0

2. Measure

The Myers-Briggs Type Indicator (MBTI) is a forced-choice, self-report personality inventory based on Carl Jung's theory of psychological type. It was selected for this research because of its solid construction, reliability, and detailed research manual. The MBTI assesses personality type using four dichotomous dimensions that relate to preferences for gathering information and making decisions. These four dimensions make possible 16 distinct personality types see Appendix A (Briggs-Myers, 1998).

The MBTI instrument identifies four separate dichotomies, Extraversion versus Introversion, Sensing versus Intuition, Thinking versus Feeling, and Judging versus Perceiving. An individual is assumed to have a preference for one of each pair of ways to perceive or think. The four preferences direct the characteristic use of perception and judgment by an individual.

Extraversion vs. Introversion (E-I): As seen in Table 6, Extraverts are oriented primarily toward the outer world; thus they tend to focus their energy toward the outer world. Introverts are oriented primarily toward the inner world; thus they tend to focus their energy on concepts, ideas, and internal experiences (Briggs-Myers, 1998).

Table 6: Effects of Extraversion-Introversion in Work Situations

Extraversion	Introversion
Like variety and action.	Like quiet concentration.
Dislike complicated procedures.	Tend to be careful with details.
Often good at greeting people.	Have trouble remembering names and faces.
Impatient with long, slow jobs.	Don't mind working on long projects.
Interested in results of their job.	Interested in the idea behind their job.
Do not mind interruption.	Dislike interruptions.
Often act quickly.	Like to think before they act.
Like to have people around.	Work contently alone.
Usually communicate freely.	Have problems communicating.

Sensing vs. Intuition (S-N): As seen in Table 7, the S-N dichotomy is designed to reflect a person's preferences between two opposite ways of perceiving. A person may rely primarily upon the process of Sensing (S), and attend to observable facts through the five senses. In contrast, a person may rely upon the less obvious process of Intuition (N), and attend to meanings, relationships, or possibilities that have been worked out beyond the reach of the conscious mind (Myers-Briggs, 1998).

Table 7: Effects of Sensing-Intuition in Work Situations

Sensing	Intuition
Dislike new problems.	Like solving new problems.
Like established order of things.	Dislike doing the same thing repeatedly.
Enjoy using skills already learned.	Enjoy learning a new skill more than using it.
Work steadily.	Work in short bursts of energy.
Patient with routing details.	Impatient with routine details.
Impatient with complicated details.	Patient with complicated situations.
Often not inspired.	Follow their inspirations.
Seldom make errors of fact.	Frequently make errors of fact.
Tend to be good at precise work.	Dislike taking time for precision.

Thinking vs. Feeling (T-F): As seen in Table 8, people who prefer thinking in decision-making tend to base conclusions on logical analysis with a focus on objectivity and detachment. People who prefer feeling, base conclusions on personal or social values with a focus on understanding and harmony (Myers-Briggs, 1998).

Table 8: Effects of Thinking-Feeling in Work Situations

Thinking	Feeling
May be uncomfortable dealing with people's feelings.	Tend to be very aware of other people and their feelings.
May hurt people's feelings without knowing it.	Enjoy pleasing people, even in unimportant things.
Like analysis and putting things into order.	Like harmony.
Tend to decide impersonally. May pay insufficient attention to people's wishes.	Let decisions be influenced by personal likes and dislikes.
Need to be treated fairly.	Need occasional praise.
Able to reprimand or fire people.	Dislike telling people bad news.
Analytically oriented.	People-oriented.
Tend to be firm-minded.	Tend to be sympathetic.

Derived from *Manual: A guide to the development and use of the Myers-Briggs Type Indicator*, (p.79) by I.B. Myers and M. H. McCaulley, 1985, Palo Alto, CA: Consulting Psychologists Press.

Judging vs. Perceiving (J-P): Table 9 shows that the J-P dichotomy is designed to identify the process a person tends to use in dealing with the outer world, that is, with the external part of life. A person who prefers a Judging (J) process typically uses either Thinking or Feeling (the Judging processes) when dealing with the outer world. A person who prefers a Perceiving (P) process reports a preference for using either Sensing or Intuition (the perceiving processes) when dealing with the outer world. In any new activity, it is appropriate to use a perceiving function (S or N) to observe or take in the situation; then it is appropriate to use a judging function (T or F) to decide on the appropriate action. Perceiving types typically remain longer in the observing attitude because it is more comfortable and natural for them. Judging types move more quickly through perception in order to reach conclusion and achieve closure, as they are most comfortable and satisfied when a plan has been developed or when a decision has been made (Myers-Briggs, 1998).

Table 9: Effects of Judgment-Perception in Work Situations

Judgment	**Perception**
Work best when they can plan their work.	Adapt well to changing situations.
Like to get things settled and finished.	Like to leave things open for change.
May decide things too quickly.	May have trouble making decisions.
May dislike interrupting the project they are on for a more urgent one.	May start too many projects and have difficulty finishing them.
May not notice new things to be done.	May postpone unpleasant jobs.
Need only the essentials to begin their job.	Want to know all about a new job.
Tend to be satisfied once they reach a judgment on a thing, situation, or person.	Tend to be curious and welcome a new light on a thing, situation, or person.

Derived from *Manual: A guide to the development and use of the Myers-Briggs Type Indicator*, (p.79) by I.B. Myers and M. H. McCaulley, 1985, Palo Alto, CA: Consulting Psychologists Press.

Selection of variables is driven by a desire to test Tinto's (1993) theory of academic integration and Roush's (1989) theory of personality type and Astin's (1996) model for studying student persistence and student involvement, described in Chapter II, not to evaluate the vast array of variables that have at one time or another been associated with attrition.

3. Model

The data were analyzed using SPSS software. Descriptive statistics were computed using frequencies, means, standard deviations, cross tabulations and Chi-square tests of significance. The Phi correlation coefficient will be used instead of the Pearson correlation. The Phi correlation coefficient is designed to measure the degree of relation for two variables, which are binary or dichotomous. The Yates continuity correction will be used because when it is applied to 2x2 tables, it gives a better approximation to the binomial distribution. The Yates correction is conservative in the sense of making it more difficult to establish significance. Since the focus of this thesis is a descriptive analysis of minority attrition behavior at USNA, the relationships between the dependent variable (attrition) and the explanatory variables is essential. In addition to

analyzing personality characteristics between individuals who leave USNA and those who do not, comparisons were made between early and late attrition.

IV.   DATA ANALYSIS

A.   OVERVIEW

The purpose of this chapter is to examine the predictors of minority attrition at United States Naval Academy (USNA). Three categories of predictor variables are examined: gender, academic measures, and Myers-Briggs Personality Type Indicators (MBTI). The dependent variable in all analyses is the dichotomous variable of attrite vs. graduate. All independent (predictor) variables are also dichotomized. This chapter presents the results of analyses of the data employed in this study. It also discusses those finding in terms of previous research discussed in Chapter II.

In an effort to characterize the data, 2x2 Tables are constructed and Chi Squares are run using the SPSS software. The Yates continuity correction will be used because when it is applied to 2x2 tables, it gives a better approximation to the binomial distribution (Norusis, 2000). The Yates correction is conservative in the sense of making it more difficult to establish significance. The overall goal of this analysis is to examine factors that might differentially predict attrition of minority students.

This chapter is segmented into three sections in an effort to characterize the data. Section one examines observed frequencies, cross tabulations and Chi squares with gender. The second section of this chapter uses Chi squares to measure the relationship of academic measures (SAT Math, SAT Verbal, Recommendation of School Officials) and minority attrition. The third section examines the relationship between the MBTI and minority attrition. The final section will look at early versus late attrition, early being plebe summer through first semester junior year, and late being all others.

B.   NAVAL ACADEMY SAMPLE AND GENDER ANALYSIS

The sample obtained from the Institutional Research Department at the Naval Academy includes all 12,099 midshipmen from the classes 1991 through 2000. These midshipmen entered the Naval Academy between 1987 - 1996 and graduated four years later. The majority sample consisted of 9,873 midshipmen, 81.6% of the population. The minority subset consists of 2,226 midshipmen, 18.4% of the total population. Of this

latter sample, 1,917 midshipmen (86.1%) are male and 309 (13.9%) are female. As demonstrated in Table 10, the graduation rate for minority students is 81.0%. This is in comparison with a graduation rate of 81.9% for Caucasian students. The overall attrition rate for women is higher than the rate for men, for both Caucasians and Minorities (see Table 10). This confirms previous research at service academies, (Murray and Johnson, 2001; Mitchell, 1999). This service academy data stands in contrast to the attrition pattern in traditional colleges where research has shown THAT men tend to have higher attrition rates than women, (Astin, 1996, Cahill, 1993).

Table 10: Gender as Predictor of Attrition

	Percentage Attrition from USNA	
	Caucasian	Minority
Variable	18.1%	19%
Females	27.4%	26.2%
Males	16.8% (ns)	17.0% (ns)
$?^2$	81.67 **	11.75 **
	N = 9873	N = 2226
** p < .01; * p < .05; ns = not significant		

C. ACADEMIC PREDICTOR VARIABLES

One of the many strengths of the Naval Academy is that it attracts a broad range of individuals with very high SAT scores. Three academic variables were analyzed: SAT Math, SAT Verbal, and Recommendation of School Officials. The median score for each variable was computed and comparisons made between groups above and below the median. The median scores were SAT Math 650, SAT Verbal 640, and RSO 877. The academic variables, SAT Math, SAT Verbal, and Recommendation of School Officials, held no significant predictive value. Specifically, none of the Chi square tests showed a significant relationship between these academic measures and minority attrition. This confirms previous research. Cahill (1993) found that among Reserve Officer Training Corps (ROTC) students, SAT scores could not predict who would persist with any reliability.

D. PERSONALITY TYPES AS PREDICTOR VARIABLES

The Myers-Briggs Personality Type Indicator is a self-report instrument that has 16 possible types based on individual preferences. As Table 11 shows, the population at the Naval Academy has two dominant groups, ESTJ and ISTJ, which make up 30% of the total population. In addition, Extroverts slightly outnumber Introverts (51% to 49% respectively). According to previous research, the ESTJ personality type is well suited to the military officer occupation (Baron, 1998). The frequency of the ESTJ type in Table 12 provides additional support for this finding.

As noted in Chapter 3, the MBTI instrument identifies four separate dichotomies, Extraversion versus Introversion, Sensing versus Intuition, Thinking versus Feeling, and Judging versus Perceiving. The four preferences direct the way each individual orients, perceives, reaches conclusions, and deals with the outside world. The data are analyzed by comparing those individuals with specific personality type characteristics (focal group) with those not having that trait (contrast group) in terms of their attrition rate. The attrition rate percentage for each category is presented in Table 12. The $?^2$ shows the significance level of the contrast between the focal category and the contrast category. For example, in the first row of Table 12, Extroversion is the focal type and Introversion is the contrast type.

Evaluating the results for the focal type using the dichotomous variables, Extroverted, Sensing, Thinking, and Judging, two characteristics had a statistically significant relationship with attrition. It is clear that those individuals who possess the Feeling or Perceiving characteristics are more likely to attrite, because their attrition rates are higher than their respective focal type group. Specifically, Thinking types persist more than Feeling types and Judging types persist more than Perceiving types. This supports Provost (1985) and Roush (1989) who found that Feeling-Perceivers were most likely to resign or leave school. In this analysis, the attrition rate for Feeling types was 23.2% in contrast with 17.5% for Thinking types. The attrition rate for Perceiving types was 23.8% in contrast with 15.8% for Judging types. While not statistically significant, the relationship between Sensing-Intuiting follows similar patterns with Intuiting (N) being more likely to attrite; however, it does not reach the critical level of significance.

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Table 11: Minority Midshipmen 1991- 2000

Minority MBTI Types

N = 2226
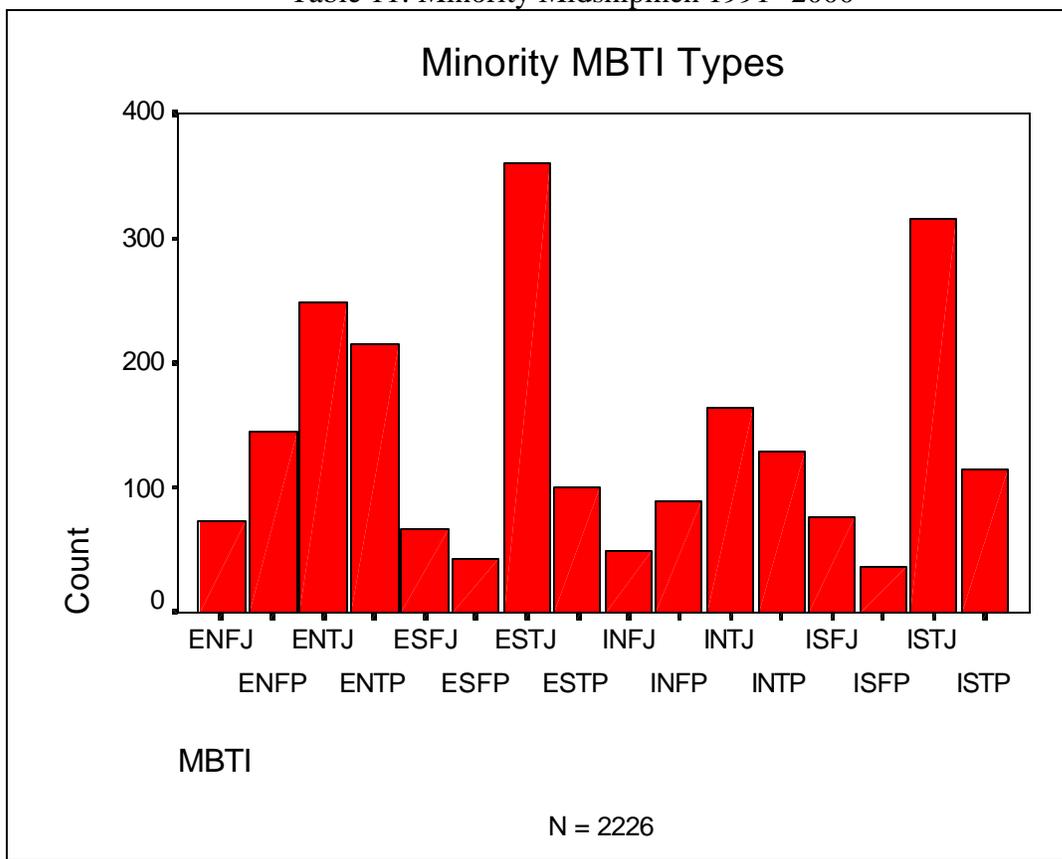
Table 12: Minority Attrition Rates for MBTI Primary Categories

MBTI Focal Type Contrast	Focal Type Attrition %	Contrast Type Attrition %	χ^2
E xtroversion vs. Introversion: E (I)	19.3	18.5	.16 (ns)
Sensing vs. Intuition: S (N)	17.8	20.1	1.88 (ns)
Thinking vs. Feeling: T (F)	17.5	23.2	8.84**
Judging vs. Perceiving: J (P)	15.8	23.8	21.43**
** $p < .01$; * $p < .05$; ns = not significant			

The four dimensions evaluated previously make possible 16 distinct personality types. Each personality type (focal type) was evaluated against all others (contrast type) in the next level of analysis. Four of the 16 personality types, were predictive of attrition/persistence (see Table 13). Two personality types ENFP and INFP, were significantly more likely to attrite. Specifically, ENFP had an attrition rate of 31.7%, in comparison with all those of other types (18.1%). Similarly, INFP had an attrition rate of 27.8%, in comparison with a rate of 18.6% for all other types.

The following is a brief synopsis of the two types that are more likely to attrite. The ENFP personality type tends to be creative, enthusiastic, and spontaneous. They often rely on their ability to improvise rather than advance planning. They want a lot of affirmation from others, and readily give appreciation and support. ENFPs hate routine, schedules, and structure and usually manage to avoid them.

The INFP personality type tends to be loyal to their values and to people who are important to them. They are sensitive, introspective, and idealistic. INFPs tend to avoid conflict and will shut down (withdraw from people and situations) if greatly stressed. These types may have difficulty in adjusting to regimented Naval Academy environment which stresses time-management, structure, and order. These findings partially replicate those of Roush (1989) and Murray and Johnson (2001) who found that the ENFP personality type were among the four most likely to resign from the Naval Academy.

Table 13: Rate of Minority attrition (%) by MBTI type

Focal Type	Rate for focal Type	Rate for all others not of focal type	$?^2$
ESTJ	14.4%	19.8%	5.34*
ENFP	31.7%	18.1%	15.58**
INFP	27.8%	18.6%	4.17 *
INFJ	14.0%	19.1%	.521 (ns)
ESFP	25.6%	18.8%	.851 (ns)
ENTJ	17.8%	19.1	.160 (ns)
ISTJ	16.5%	19.4%	1.25 (ns)
INTP	20.9%	18.8%	.224 (ns)
INTJ	12.3%	19.5%	4.66*
ESTP	17.2%	19.0%	.111 (ns)
ESFJ	23.9%	18.8%	.784 (ns)
ISTP	24.1%	18.7%	1.79 (ns)
ISFP	18.9%	19.0%	.000 (ns)
ENFJ	11.0%	19.2%	2.62 (ns)
ENTP	21.9%	18.6%	1.10 (ns)
ISFJ	19.5%	18.9%	.000 (ns)
** p < .01; * p < .05; ns = not significant			

Two MBTI personality types, ESTJ and INTJ, have statistically significant relationships with minority persistence. The attrition rate percentages of the focal groups (14.4% and 12.3%) are below the attrition rate for their respective contrast groups (19.8% and 19.5%, respectively) (see Table 13). The ESTJ personality type is positively correlated with persistence in research done by Provost (1985) and Roush (1989).

ESTJs are practical, realistic, and matter-of-fact. They are decisive and quickly move to implement decisions. They organize projects and people to get things done. Their focus is on getting things done the most efficient way possible. The structured environment of the Naval Academy appeals to this type of individual and they are suited to the military officer occupation. INTJs have original minds and great drive for implementing their ideas and achieving their goals. They are skeptical and independent, in addition to having high standards of competence and performance for themselves and others. INTJs had the highest undergraduate grade point average among college persisters

(Myers-Briggs,1998 and Provost, 1985). Academic success should result in less stress and increased rewards at the Naval Academy.

E.   COMPARISON OF SPECIFIC ETHNIC GROUPS

The current sample was divided into self-report ethnic groups and analyzed to test Astin's (1996) findings that in traditional college settings, Asian Americans have the lowest attrition rate, followed in order by Caucasians, Hispanics, Puerto Ricans, Native Americans, Others and African Americans. The results for the Naval Academy are presented in Table 14. Three groups had attrition rates that varied significantly from the overall mean. Specifically, Filipino and Asian Americans were significantly less likely to attrite from USNA than other ethnic groups. Their attrition rate percentages (11.6% and 12.7%, respectively) are below the attrition rate for the larger contrast group (18.4%). While not statistically significant, the Caucasian group follows a similar persistence pattern.

The Hispanic sub-group's attrition rate percentage of 22.1% is significantly higher than the 18.0% rate for the contrast group. While not statistically significant, the relationship between the African American, Native American and Puerto Rican groups follow a similar attrition pattern. However, they do not reach the critical level of significance. These groups all have attrition rate percentages that are higher than the contrast group. These findings partially replicate those of Astin (1996) for the Asian sub-group. However, for the Hispanic sub-group, the findings are in opposition.

Table 14: Attrition Rate Percentage for Minority Sub-Groups

Focal Type	Rate for focal Type	Rate for all others not of focal type	$?^2$
Filipino	11.6%	18.4%	5.02*
Asian-American	12.7%	18.4%	6.64*
Caucasian	18.1%	19.0%	.82 (ns)
Puerto Rican	19.1%	18.3%	.92 (ns)
African American	20.1%	18.1%	.18 (ns)
Native-American	21.4%	18.2%	.45 (ns)
Hispanic	22.1%	18.0%	6.99*
** $p < .01$; * $p < .05$; ns = not significant			

The data were further analyzed in relation to the four separate MBTI dichotomies (see Tables 15-17), Extraversion versus Introversion, Sensing versus Intuition, Thinking versus Feeling, and Judging versus Perceiving. Each ethnic group was analyzed by comparing those individuals with specific personality type characteristics (focal group) with those not having that trait (contrast group), in terms of their attrition rate. The attrition rate percentage for each category is presented in the Table. The $?^2$ shows the significance level of the contrast between the focal category and the contrast type

With two sub-groups, Caucasians and Hispanics, there was a statistically significant relationship between MBTI type and attrition/persistence. Specifically, Hispanics with a Feeling or Perceiving preference had an attrition rate percentage of (29.7 and 27.8%) respectively), which is higher than the rates for the contrast groups (18.9% and 17.6%). For Caucasians with the E, S, T, and J characteristics, there is a statistically significant relationship with persistence. The attrition rate percentages for all four focal group variables are lower than the contrast group (see Table 17). As noted earlier, this agrees with previous research (Roush, 1989 and Mitchell, 1999).

While the only statistically significant finding in Table 15 was for Hispanics, there were similar patterns for other ethnic groups. Specifically, the Asian American, Native American, and Filipino sub-groups showed a pattern similar to that of the Hispanics, with a higher attrition rate for Feeling and Perceiving preferences. However, due to small sample size, these findings did not reach the critical level for statistical significance.

It is noteworthy that the same pattern is not found for the African American and Puerto Rican groups. It is also noteworthy that a similar pattern of relationship between personality type and attrition is shown for Caucasians.

Table 15: Rate of Minority Attrition Percentage (%) for Hispanics, African Americans and Asian Americans

MBTI Type (ContrastType)	Hispanic N = 702			African American N = 797			Asian-American N = 324		
	Rate For Focal Type	Rate For Contrast Type	$?^2$	Rate For Focal Type	Rate For Contrast Type	$?^2$	Rate For Focal Type	Rate For Contrast Type	$?^2$
E (I)	23.2%	20.5%	.564 (ns)	20.3%	19.8%	.010 (ns)	10.8%	14.4%	.627 (ns)
S (N)	19.4%	24.5%	.102 (ns)	20.9%	19.2%	.245 (ns)	12.7%	12.6%	.000 (ns)
T (F)	18.9%	29.7%	9.33*	20.0%	20.5%	.001 (ns)	11.3%	17.1%	1.29 (ns)
J (P)	17.6%	27.8%	10.61**	17.8%	23.3%	3.27 (ns)	10.3%	18.7%	3.43 (ns)
** $p < .01$; * $p < .05$; ns = not significant									

Table 16: Rate of Minority Attrition Percentage (%) for Native Americans, Filipinos and Puerto Ricans

MBTI Type (ContrastType)	Native American N = 112			Filipino N = 181			Puerto Rican N = 324		
	Rate For Focal Type	Rate For Contrast Type	$?^2$	Rate For Focal Type	Rate For Contrast Type	$?^2$	Rate For Focal Type	Rate For Contrast Type	$?^2$
E (I)	21.8%	21.1%	.000 (ns)	11.8%	11.3	.000 (ns)	18.8%	19.5%	.000 (ns)
S (N)	22.6%	20.3%	.004 (ns)	7.0%	17.3	3.66 (ns)	14.9%	25.6%	1.29 (ns)
T (F)	17.4%	34.6%	2.55 (ns)	9.7%	14.7%	.596 (ns)	19.2%	18.8%	000 (ns)
J (P)	18.8%	25.6%	.371 (ns)	9.2%	16.4%	1.41 (ns)	19.7%	18.7%	.000 (ns)
** $p < .01$; * $p < .05$; ns = not significant									

Table 17: Rate of attrition percentage (%) for Caucasians

MBTI Type (ContrastType)	Caucasian N = 9873		
	Rate For Focal Type	Rate For Contrast Type	$?^2$
E (I)	17.1%	19.5%	9.23*
S (N)	15.4%	21.1%	53.03**
T (F)	16.3%	23.9%	69.57**
J (P)	15.8%	21.6%	53.80**
** $\underline{p}$ < .01; * $\underline{p}$ < .05; ns = not significant			

In this section, the data were evaluated to determine if certain MBTI types persisted or resigned along racial lines. The same sub-groups analyzed in the previous section were evaluated. Each of the 16 MBTI types (focal type) of the racial sub group was evaluated in terms of attrition percentage against all others not of the focal type. The attrition rate percentage for each category is also presented in the Tables. The $?^2$ shows the significance level of the contrast between the focal category and all others. For the most part, the cell counts are too small when dividing these groups by the 16 MBTI types to find statistically significant relationships. The results of the analysis are shown in Appendices B through G.

For the Caucasian group, six MBTI personality types have statistically significant relationships with attrition, and three MBTI personality types have statistically significant relationships with persistence. These results are shown in Table 18. The six types (ENFP, INFP, INFJ, INTP, INTJ, ISFP) all have attrition rate percentages that are higher than the rates for the others not of focal types. These findings are partially explained by Roush (1989) who found that the Naval Academy social environment would be more adverse to young people whose preferences are in the Introverted, Intuitive, Feeling, and Perceiving domains. These findings counter those of Mitchell (1999) who found the INFP, INTP, and ISFP personality types to be positively correlated with persistence. The three types that significantly predicted persistence were ESTJ, ENTJ and ISTJ. These

findings confirm the research of Provost (1985) ESTJ, ENTJ and O'Conner, (1993) ISTJ who found these personality types to be positively correlated with persistence.

Table 18: Rate of Attrition Percentage for Caucasians Four Letter MBTI
N =9873

Focal Type	Rate for focal Type	Rate for all others not of focal type	$?^2$
ESTJ	13.2%	19.2%	35.84**
ENFP	27.4%	17.5%	35.44**
INFP	29.0%	17.7%	29.42**
INFJ	24.1%	18.0%	5.28*
ESFP	16.0%	18.2%	.486 (ns)
ENTJ	14.6%	18.5%	9.07*
ISTJ	14.3%	18.8%	16.04**
INTP	21.4%	17.9%	4.78*
INTJ	20.2%	18.0%	4.66*
ESTP	16.0%	18.2%	1.53 (ns)
ESFJ	16.8%	18.1%	.264 (ns)
ISTP	17.9%	18.1%	.007 (ns)
ISFP	31.3%	17.9%	16.59**
ENFJ	22.0%	18.0%	2.78 (ns)
ENTP	20.2%	17.9%	3.00 (ns)
ISFJ	20.7%	18.0%	.883 (ns)
** p < .01; * p < .05; ns = not significant			

F.   EARLY VS. LATE ATTRITION

Previous research has shown that a higher percentage of students make the decision to leave during the first two years of college Astin (1996). Mitchell (1999) found that, at the Naval Academy, 90.4% of voluntary attrition for both genders occurred in the period from plebe summer through the summer prior to the start of second-class/junior year. It is at this point that a service obligation is incurred. Based on this information, this study defined early attrition as any that occurred prior to the start of the junior year and late attrition as any that occurred after the start of the junior year. Approximately 74% of the total attrition of minorities occurred during the first two years of attendance at the Naval Academy. These findings are consistent with those of Astin

(1996) who found that most college students depart within the first two years; but is somewhat lower than the rate found by Murray and Johnson (2001). As noted earlier, each of the 16 MBTI types (focal type) of the group is evaluated in terms of attrition percentage against all others not of focal type. The attrition rate percentage for each category is presented in Tables 19 and 20. The $?^2$ shows the significance level of the contrast between the focal category and all others.

1. Early Attrition

Two MBTI personality types (ENFP, ISTP) had a statistically significant relationship to minority attrition (see Table 19). Specifically, the attrition rate percentages of the focal groups (32.4% and 28.4%, respectively) were higher than the rate for all others not in the focal group (19.6% and 20.0%, respectively). These higher percentages indicate a higher tendency for these personality types to attrite. The ENFP type, as mentioned earlier, needs positive affirmation from others, and often relies on his or her ability to improvise rather than advance planning. The ISTP type values efficiency and is interested in cause and effect. As with any large organization, efficiency is often directly proportional to one's perspective. Since the Naval Academy is a highly structured institution in which every waking moment of the midshipmen's life is planned, these types may find the environment less attractive. One personality type, ESTJ, had a statistically significant relationship with persistence. Specifically, the attrition rate percentage for the focal group (ESTJ) was 15.8%, which is lower than the 21.3% rate for all others not of focal type. This agrees with previous research (Mitchell, 1999).

The pattern of early attrition is identical to minority attrition overall (see Table 13). While the level of statistical significance is not reached for MBTI type INFP, this can be accounted for due to the small sample size.

2. Late Attrition

Within the late attrition group, those who attrite after the beginning of the junior/second class year, one MBTI personality type, ENTP, was significantly predictive of attrition (see Table 20). Specifically, the attrition rate percentage of the ENTP group (13.5%) was higher than the rate for all others not in the focal group (6.5%). The higher attrition percentage rate indicates a higher tendency for this personality type to attrite.

ENTP's are ingenious, outspoken and alert. They are good at reading other people and bored by routine. They will seldom do the same thing the same way and are apt to turn to one new interest after another. The small sample size of this group left some cells with numbers that were too small to reach statistical significance.

Table 19: Rate of Early Attrition of Minorities
(Percentage)

	Rate for focal type	Rate for all others not of focal type	$?^2$
ESTJ	15.8%	21.3%	5.27*
ENFP	32.4%	19.6%	12.89**
INFP	26.7%	20.2%	1.85 (ns)
INFJ	20.0%	20.5%	.000 (ns)
ESFP	20.9%	20.4%	.000 (ns)
ENTJ	18.2%	20.7%	.697 (ns)
ISTJ	17.5%	20.9%	1.79 (ns)
INTP	19.4%	20.5%	.038 (ns)
INTJ	16.0%	20.8%	1.89 (ns)
ESTP	24.2%	20.3%	.693(ns)
ESFJ	22.4%	20.4%	.061 (ns)
ISTP	28.4%	20.0%	4.32*
ISFP	24.3%	20.4%	.148 (ns)
ENFJ	17.8%	20.5%	.176 (ns)
ENTP	21.9%	20.3%	.206 (ns)
ISFJ	20.8%	20.4%	.000 (ns)
** $\underline{p} < .01$; * $\underline{p} < .05$; ns = not significant			

Table 20: Rate of Late Attrition of Minorities
(Percentage)

	Rate for focal type	Rate for all others not of focal type	$?^2$
ESTJ	5.6%	7.5%	1.23 (ns)
ENFP	6.9%	7.2%	.000 (ns)
INFP	8.9%	7.1%	.185 (ns)
INFJ	2.0%	7.3%	1.35 (ns)
ESFP	7.0%	7.2%	.000 (ns)
ENTJ	8.9%	7.0%	.958 (ns)
ISTJ	6.0%	7.4%	.547 (ns)
INTP	8.5%	7.1%	.186 (ns)
INTJ	4.9%	7.4%	1.03 (ns)
ESTP	8.1%	7.1%	.023 (ns)
ESFJ	7.5%	7.2%	.000 (ns)
ISTP	3.4%	7.4%	2.00 (ns)
ISFP	5.4%	7.2%	.010 (ns)
ENFJ	1.4%	7.4%	2.98 (ns)
ENTP	13.5%	6.5%	13.14**
ISFJ	20.8%	20.4%	.000 (ns)
** $p < .01$; * $p < .05$; ns = not significant			

G.   SUMMARY

This data analysis revealed that with regards to gender, more women then men attrite from the Naval Academy regardless of ethnic group. It also showed that the academic variables SAT Math, SAT Verbal and Recommendation of School Officials, held little predictive value of minority attrition. The ethnic types with the lowest attrition rates were Filipino, Asian American and Puerto Rican. The ethnic types that were most at risk with the highest attrition rate percentages were African American, Native American, and Hispanics.

The MBTI analysis highlighted the fact that the INFP personality type is predictive of attrition for majority students. A significant positive relationship was found between the Feeling and Perceiving MBTI characteristics and likelihood of attrition for Caucasians and Hispanics. A similar, but non-significant trend was found for Asian Americans, Native Americans, and Filipino ethnic groups. This pattern does not hold true

for African American or Puerto Rican students. Approximately 74% of minority students who attrite do so during the first two years. The attrition patterns for early attrition and MBTI types are consistent with the overall pattern for minority students.

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V.   CONCLUSIONS AND RECOMMENDATIONS

The primary purpose of this research was to examine the relationship between personality type and minority attrition. The present study was designed to provide an exploratory assessment of the relationship between personality type, achievement test scores, and Recommendation of School Officials and subsequent success or attrition among minority students at USNA.

A. CONCLUSIONS

1.   Are certain MBTI personality types significantly related to minority attrition at USNA?

Two personality types, ENFP and INFP, were significantly related to attrition among minority students. Specifically, those with an ENFP type had an attrition rate of 31.7%, in comparison with minority students with all other types (18.1%). Similarly, those with an INFP type had an attrition rate of 27.8%, in comparison with a rate of 18.6% for all other types.

The following is a brief synopsis of the two types that are more likely to attrite. The ENFP personality type tends to be creative, enthusiastic, and spontaneous. They often rely on their ability to improvise rather than advance planning. They want a lot of affirmation from others, and readily give appreciation and support. ENFPs hate routine, schedules, and structure and usually manage to avoid them. The INFP personality type tends to be loyal to their values and to people who are important to them. They are sensitive, introspective, and idealistic. INFPs tend to avoid conflict and will shut down (withdraw from people and situations) if greatly stressed. These types may have difficulty in adjusting to regimented Naval Academy environment which stresses time-management, structure, and order. These findings partially replicate those of Roush (1989) and Murray and Johnson (2001) who found that the INFP and ENFP personality types were among the two most likely to resign from the Naval Academy.

2. Are certain MBTI types significantly related to minority success at USNA?

Two MBTI personality types, ESTJ and INTJ, had statistically significant relationships with minority persistence. The attrition rate percentages of students with ESTJ and INTJ types (14.4% and 12.3%, respectively) were below the attrition rate for their respective contrast groups (19.8% and 19.5% respectively). The ESTJ personality type is positively correlated with persistence in research done by Provost (1985) and Roush (1989).

ESTJs are practical, realistic, and matter-of-fact. They are decisive and quickly move to implement decisions. They organize projects and people to get things done. Their focus is on getting things done the most efficient way possible. The structured environment of the Naval Academy appeals to this type of individual and they are suited to the military officer occupation.

INTJs have original minds and great drive for implementing their ideas and achieving their goals. They are skeptical and independent, in addition to having high standards of competence and performance for themselves and others. INTJs had the highest undergraduate grade point average among college persisters (Myers-Briggs, 1998 and Provost, 1985). In light of these traits, it is not surprising that INTJs experience less stress and increased rewards at the Naval Academy.

3.   Are there personality type differences between minority students who attrite early vs. late?

Previous research has shown that a higher percentage of students make the decision to leave during the first two years of college (Astin,1996). Mitchell (1999) found that, at the Naval Academy, 90.4% of voluntary attrition for both genders occurred in the period from plebe summer through the summer prior to the start of second-class/junior year. It is at this point that a service obligation is incurred. Based on this information this study defined early attrition as any that occurred prior to the start of the junior year and late attrition as any that occurred after the start of the junior year. Approximately 74% of the total attrition of minorities occurred during the first two years of attendance at the Naval Academy. These findings are consistent with those of Astin,

(1996) who found that most college students depart within the first two years but is somewhat lower than the rate found by Murray and Johnson (2001).

Two MBTI personality types (ENFP, ISTP) were significantly more likely to attrite early among minority midshipmen. Specifically, the attrition rate percentages of 32.4% (ENFP) and 28.4% (ISTP) were higher than the rate for all other types (19.6% and 20.0%, respectively). The ENFP type, as mentioned earlier, needs positive affirmation from others, and often relies on his or her ability to improvise, rather than advance planning. The ISTP type values efficiency and is interested in cause and effect. As with any large organization, efficiency is often directly proportional to one's perspective. Since the Naval Academy is a highly structured institution in which every waking moment of the midshipmen's life is planned, these types may find the environment less attractive.

Within the late attrition group, those who attrite after the beginning of the junior/second class year, one MBTI personality type was significantly predictive of late attrition among minority students. Specifically, the attrition rate percentage of the ENTP group (13.5%) was higher than the rate for all others not in the focal group (6.5%). ENTP's are ingenious, outspoken and alert. They are good at reading other people and bored by routine. They will seldom do the same thing the same way and are apt to turn to one new interest after another. It is unclear why this personality type is predictive of late attrition; however, midshipmen who are bored with routine may have tremendous difficulty weathering the more mundane features of military life after the first two years at USNA.

4. Is there a link between academic performance and attrition?

Three academic variables were analyzed: SAT Math, SAT Verbal, and Recommendation of School Officials. The median score for each variable was computed and comparisons made between groups above and below the median. The median scores were SAT Math 650, SAT Verbal 640, and RSO 877. None of the academic variables held significant predictive value with regard to attrition. This confirms previous research. Cahill (1993) found that among Reserve Officer Training Corps (ROTC) students, SAT scores could not predict who would persist with any reliability. Because of the high

scores on these measure the lack of a meaningful spread contributed to these findings. It appears that even in the academically rigorous USNA milieu, these academic variables are not significantly predictive of persistence versus attrition.

B.   LIMITATIONS

There are several limitations with the current study that must be highlighted. First, the data is archival and conclusions are limited to speculations about the reasons for significant correlations between variables. It is not possible to conclude that personality type as measured by the MBTI is directly causal with respect to attrition. Second, the MBTI itself is not traditionally considered a strong measure for research purposes. Designed primarily as an applied tool for lay audiences (for the purpose of generating basic self-awareness regarding primary personality features), the MBTI does not have strong psychometric properties; it was developed from Jung's theory of personality type versus a more empirical/statistical method. Contemporary personality research relies nearly exclusively on measures that are rooted in the Five-factor theory of personality, and the strongest measures among these (e.g., the 16PF) are developed using factor analytic methods. Because the MBTI has so many personality types, reliability of some statistical analyses was compromised by low cell frequencies. A larger sample of minority midshipmen would be required to accurately evaluate the relationship between attrition and each MBTI type. Finally, the current study offers only modest assistance in understanding the cause of attrition among minority students at USNA. Not only were academic variables found to be unhelpful as predictors of attrition, MBTI results indicated that personality type is not a particularly salient indicator of attrition versus persistence.

C.   RECOMMENDATIONS

Further quantitative and qualitative research needs to be conducted on minority attrition. With respect to qualitative approaches, interviews could be conducted with minority midshipmen who attrite to add a qualitative and phenomenological component to future research. These interviews should be informal and not part of the checkout

process. The interviewer should be a minority junior officer outside the midshipman's chain of command. This would promote an atmosphere where the interviewee feels free to speak openly and honestly. Consideration should also be given to developing a survey that could be used to more accurately assess specific reasons for early disenrollments. It is highly recommended that USNA consider collecting more thorough information relative to midshipmen who attrite. Specifically, it would be useful to include alternative measures of personality (the 16PF would be a good alternative). By assessing minority attrition with respect to more commonly accepted dimensions of personality (e.g., the five-factor model), it would be possible to compare USNA data with other research bearing on attrition at civilian universities. Additional data sources might include a brief measure of cultural or ethnic identification and a measure of perceived racism. Finally, some indicator of the extent to which minority midshipmen experienced salient mentor relationships with faculty, company officers, senior midshipmen, etc., might offer another important variable for use in predicting attrition.

Finally, it is recommended that subsequent research involve collaboration between USNA and researchers at the other United States service academies. A similar study using the MBTI has been done at the United States Coast Guard Academy. Perhaps a joint study of all the service academies with MBTI data available would offer a better picture of minority attrition behavior.

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APPENDIX A

	SUMMARIES OF THE 16 MBTI PERSONALITY TYPES
ISTJ	Quiet, serious, realistic, responsible, orderly, values traditions and loyalty, decides logically what should be done and works steadily
ISFJ	Quiet, friendly, responsible, conscientious, thorough, concerned with how other people feel.
INFJ	Seeks meaning and connection in ideas and relationships, insightful about others, committed to firm values, organized and decisive
INTJ	Great drive for implementing ideas, quickly sees patterns, skeptical and independent, high standards of competence and performance
ISTP	Tolerant and flexible, acts quickly to find solutions, analyzes what makes things work, interested in cause and effect, values efficiency
ISFP	Quiet, friendly, sensitive, kind, like to have their own space, dislike disagreements, don't force their opinions on others
INFP	Idealistic, loyal to values, want an external life congruent with their values, curious, seek to understand people, adaptable, flexible, and accepting
INTP	Seek to develop logical explanations for everything that interests them, theoretical, abstract, more interested in ideas than social interaction, adaptable, focus in depth on problems, analytical
ESTP	Flexible, tolerant, acts energetically to solve problems, spontaneous, enjoys material comforts, learn best through doing
ESFP	Outgoing, friendly, accepting, enjoy working with others, brings common sense to their work, flexible, spontaneous, learn best by trying a new skill with others
ENFP	Enthusiastic, imaginative, makes connections between events and information quickly, seeks affirmation from others, readily gives appreciation and support
ENTP	Quick, ingenious, stimulating, alert, outspoken, resourceful in solving new problems, good at reading other people, bored with routine
ESTJ	Practical, realistic, matter-of-fact, decisive, focuses on getting results efficiently, clear set of logical standards, forceful in implementing their plans
ESFJ	Warmhearted, conscientious, cooperative, seek harmony in their environment, enjoys working with others, loyal, want to be appreciated
ENFJ	Warm, empathetic, responsive, responsible, highly attuned to emotions of others, finds potential in everyone, acts as catalyst for individual and group growth, sociable, provide inspiring leadership
ENTJ	Frank, decisive, assume leadership readily, quickly sees illogical procedures, enjoys long-term planning, will-informed, forceful in presenting their ideas

Source: Adapted from Myers-Briggs, 1998.

E, extroverted; I, introverted; S, sensing; N, intuitive; T, thinking; F, feeling; J, judging; P, perceiving.

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APPENDIX B

Rate of Attrition (Percentage) for Puerto Ricans by Four Letter MBTI
N =110

Focal Type	Rate for focal Type	Rate for all others not of focal type	χ^2
ESTJ	15.4%	20.2%	.070 (ns)
ENFP	11.1%	19.8%	.037 (ns)
INFP	0%	19.4%	.000 (ns)
INFJ	100%	17.6%	4.12*
ESFP	0%	19.4%	.000 (ns)
ENTJ	50%	16.7%	3.40 (ns)
ISTJ	8.3%	20.4%	.379 (ns)
INTP	16.7%	19.2%	.000 (ns)
INTJ	0%	19.8%	.117 (ns)
ESTP	20.0%	19.0%	.000 (ns)
ESFJ	0%	20.4%	.691 (ns)
ISTP	20.0%	19.0%	.000 (ns)
ISFP	33.3%	18.7%	.000 (ns)
ENFJ	0%	19.1%	.000 (ns)
ENTP	25.05	18.4%	.026 (ns)
ISFJ	28.6%	18.4%	.026 (ns)
** $\underline{p}$ < .01; * $\underline{p}$ < .05; ns = not significant			

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APPENDIX C

Rate of Attrition (Percentage) for Asian Americans by Four Letter MBTI
N=324

Focal Type	Rate for focal Type	Rate for all others not of focal type	$?^2$
ESTJ	7.7%	13.6%	.897 (ns)
ENFP	25.0%	12.2%	.754 (ns)
INFP	33.3%	12.1%	1.92 (ns)
INFJ	6.7%	12.9%	.100 (ns)
ESFP	25.0%	12.25	.754 (ns)
ENTJ	7.3%	13.4%	.720 (ns)
ISTJ	13.35	12.5%	.000 (ns)
INTP	11.1%	12.7%	.000 (ns)
INTJ	10.8%	12.9%	.009 (ns)
ESTP	0%	12.9%	.032 (ns)
ESFJ	25.0%	12.3%	.276 (ns)
ISTP	18.2%	12.5%	.010 (ns)
ISFP	25.0%	12.3%	.276 (ns)
ENFJ	0%	13.1%	.677 (ns)
ENTP	20.8%	12.05	.871 (ns)
ISFJ	22.2%	12.4%	.135 (ns)
** $\underline{p} < .01$; * $\underline{p} < .05$; ns = not significant			

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APPENDIX D

Rate of Attrition (Percentage) for Native Americans by Four Letter MBTI
N=112

Focal Type	Rate for focal Type	Rate for all others not of focal type	$?^2$
ESTJ	11.1%	23.4%	.724 (ns)
ENFP	50.0%	19.8%	1.54 (ns)
INFP	25.0%	21.2%	.000 (ns)
INFJ	0.00%	21.8%	.000 (ns)
ESFP	0.00%	21.6%	.000 (ns)
ENTJ	15.4%	22.2%	.042 (ns)
ISTJ	21.1%	21.5%	.000 (ns)
INTP	16.7%	22.0%	.003 (ns)
INTJ	12.5%	22.1%	.037 (ns)
ESTP	33.3%	21.1%	.000 (ns)
ESFJ	50.0%	20.4%	.636 (ns)
ISTP	25.0%	21.3%	.000 (ns)
ISFP	0.00%	24.0%	.000 (ns)
ENFJ	0.00%	21.6%	.000 (ns)
ENTP	22.2%	21.4%	.000 (ns)
ISFJ	50.0%	20.4%	.636 (ns)
** $\underline{p}$ < .01; * $\underline{p}$ < .05; ns = not significant			

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APPENDIX E

Rate of Attrition (Percentage) for African Americans by Four Letter MBTI
N=797

Focal Type	Rate for focal Type	Rate for all others not of focal type	χ^2
ESTJ	17.9%	20.5%	.288 (ns)
ENFP	22.7%	19.9%	.067 (ns)
INFP	22.7%	20.0%	.002 (ns)
INFJ	7.1%	20.0%	.778 (ns)
ESFP	28.6%	19.9%	.215 (ns)
ENTJ	20.0%	20.1%	.000 (ns)
ISTJ	15.9%	20.7%	1.06 (ns)
INTP	18.8%	20.2%	.003 (ns)
INTJ	17.9%	20.3%	.092 (ns)
ESTP	21.4%	20.0%	.008 (ns)
ESFJ	31.3%	19.8%	.659 (ns)
ISTP	34.0%	19.2%	5.18*
ISFP	16.7%	20.1%	.000 (ns)
ENFJ	9.1%	20.4%	.009 (ns)
ENTP	21.7%	19.9%	.059 (ns)
ISFJ	22.2%	20.05	.009 (ns)
** $p < .01$; * $p < .05$; ns = not significant			

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APPENDIX F

Rate of Attrition (Percentage) for Hispanics by Four Letter MBTI
N=702

Focal Type	Rate for focal Type	Rate for all others not of focal type	χ^2
ESTJ	14.8%	23.4%	3.43 (ns)
ENFP	43.3%	20.1%	15.90**
INFP	31.6%	21.5%	1.56 (ns)
INFJ	14.3%	22.2%	.148 (ns)
ESFP	37.5%	21.7%	1.44 (ns)
ENTJ	19.7%	22.3%	.126 (ns)
ISTJ	24.1%	21.8%	.127 (ns)
INTP	29.3%	21.6%	.902 (ns)
INTJ	4.8%	23.2%	6.75*
ESTP	11.5%	22.5%	1.17 (ns)
ESFJ	30.4%	21.8%	.528 (ns)
ISTP	16.7%	22.4%	.463 (ns)
ISFP	20.0%	22.1%	.000 (ns)
ENFJ	16.0%	22.3%	.251 (ns)
ENTP	23.7%	21.9%	.044 (ns)
ISFJ	13.0%	22.4%	.651 (ns)
** $p < .01$; * $p < .05$; ns = not significant			

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Rate of Attrition (Percentage) for Filipinos by Four Letter MBTI
N=181

Focal Type	Rate for focal Type	Rate for all others not of focal type	$?^2$
ESTJ	12.1%	11.5%	.000 (ns)
ENFP	21.4%	10.8%	.579 ns)
INFP	27.3%	10.6%	1.41 (ns)
INFJ	33.0%	11.2%	.076 (ns)
ESFP	16.7%	11.4%	.000 (ns)
ENTJ	10.5%	11.7%	.000 (ns)
ISTJ	3.3%	13.2%	1.53 (ns)
INTP	25.0%	11.3%	.003 (ns)
INTJ	20.0%	11.4%	.000 (ns)
ESTP	0.00%	11.9%	.000 (ns)
ESFJ	0.00%	12.2%	.338 (ns)
ISTP	14.3%	11.5%	.000 (ns)
ISFP	0.00%	11.9%	.000 (ns)
ENFJ	14.3%	11.4%	.000 (ns)
ENTP	9.1%	11.8%	.000 (ns)
ISFJ	0.00%	12.1%	.141 (ns)
** $p < .01$; * $p < .05$; ns = not significant			

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